

## REMARKS

### 1. Status of Claims.

Claims 1–4 and 6–22 (as re-numbered) are pending in the Application after entry of the present Amendment. Renumbered claims 14–21 have been withdrawn and claim 5 has been canceled. Claims 1, 4, 8 and 11 have been amended, and new dependent claim 22 added. Claims 1–4, 6–13, and 22 thus remain for consideration upon entry of the present Amendment.

No new matter has been introduced by these amendments. Support for the amendments to claims 1, 4, and 11 may be found on amended page 5 of the Specification, lines 10-20. Support for the amendments to claim 8 may be found on page 3, line 2, page 4, lines 11-13, and page 7, lines 2-6.

In its broadest aspect, the claimed method for the production of conductive polymers eliminates the use of volatile organic compounds, i.e., VOCs. For example, Applicants state on page 7, lines 2-6 that “[t]he prior art of the preparation of conductive polymer composites relies on the use of large amounts of VOCs, which are completely eliminated by the invention described herein.” Thus, amended claim 8 recites a method wherein the impregnation of the polymer with the vaporous catalyst occurs in the absence of a volatile organic compound.

However, the use of a solvent such as supercritical carbon dioxide is within the scope of amended claim 8 and is not precluded by Applicants’ elimination of VOCs. That is, solvents such as supercritical carbon dioxide are outside the scope of ‘VOCs’ as used by Applicants.

This can be seen by the fact that Applicants’ Specification discloses two embodiments within the broad scope of amended independent claim 8.

In the first embodiment, impregnation is solventless, i.e., see the Specification, page 7, lines 19-23, and page 8, lines 1-3. As set forth in Applicant’s example in this portion of the Specification, nothing other than iodine vapor is used in the impregnation step. This embodiment is the subject of amended independent claim 1, which requires that the impregnation process be solventless, i.e., occur in the absence of solvent. Thus, as used in

claim 1, the term solvent includes both volatile organic compounds as well as solvents such as supercritical carbon dioxide.

In contrast, a second embodiment discloses impregnation wherein the vaporous catalyst is dissolved in a solvent such as supercritical carbon dioxide, i.e., see the Specification, page 8, lines 4-20, and page 9, lines 10-11. From these teachings, it can be seen that Applicants' use of the term 'solvent' refers to a dispersing medium of a solution that is not a VOC. As illustrated in the working examples on pages 8 and 9, an example of such a solvent is supercritical carbon dioxide, i.e., 'iodine dissolved in  $\text{scCO}_2$ '. Thus, the term 'VOC' as used in claim 8 does not encompass a solvent such as supercritical carbon dioxide.

It is noted that the use of the word "solventless" on page 2 of the Specification was a typographical error that is corrected with the above amendment to the Specification.

Entry of the claim amendments is respectfully requested.

**2. Rejection of Claims 1- and 6-7 under 35 U.S.C. §102(b).**

Claims 1-3 and 6-7 stand rejected under 35 U.S.C. § 102(b), as anticipated by Y. Fu, D. Palo, C. Erkey, and R. Weiss "Synthesis of Conductive Polypyrrole/Polyurethane Foams via a Supercritical Fluid Process", hereinafter "Weiss et al."

As set forth above, amended independent claim 1 discloses a method for the production of conductive polymers wherein the impregnation step is solventless. As taught in the Specification, impregnation in this process occurs in the absence of volatile organic compounds or a solvent such as supercritical carbon dioxide.

In contrast, Weiss et al. discloses use of a nonhalogen based catalyst, i.e.,  $\text{Fe}(\text{CF}_3\text{SO}_3)_3$ , that is dissolved in supercritical carbon dioxide. Nothing in this reference teaches or suggests the use of a halogen catalyst in the vapor phase.

To constitute anticipation, all material elements of a claim must be found in one prior art source. *In re Marshall*, 198 U.S.P.Q. 344 (C.C.P.A. 1978). Weiss et al. therefore does not anticipate amended independent claim 1 or any of its dependent claims.

Accordingly, Applicant respectfully requests reconsideration of the rejection of Claims 1-3 and 6-7.

**3. Possible Rejection of Claims 1- and 6-7 under 35 U.S.C. §103(a).**

It is understood per the Advisory Action that amended independent claims 1 and 8 will likely be rejected as obvious under 35 USC 103(a) over Weiss et al in view of Bessette et al., i.e., a rejection that was previously applied to now canceled claim 5 but which would be new with respect to amended independent claims 1 and 8.

Based on the text of paragraph 16 of the Office Action of 1/2/04, it appears that the PTO's may take the position that it would have been obvious for one of ordinary skill in the art to have substituted one of the oxidants taught by Bessette et al. such as iodine for the oxidant in Weiss et al., thereby performing impregnation with iodine in supercritical carbon dioxide, with the expectation of successful results since Bessette et al teaches that iodine is a known oxidant for pyrrole and since Weiss et al is not limited as to the oxidants that may be used in its invention.

Applicants will await a formal rejection before responding fully, but wish to note the following for the purposes of clarification.

As noted above, Weiss et al. discloses use of a nonhalogen based catalyst, i.e.,  $\text{Fe}(\text{CF}_3\text{SO}_3)_3$ , that is dissolved in supercritical carbon dioxide. Nothing in this reference teaches or suggests the use of a halogen catalyst in the vapor phase.

Bessette et al discloses a process wherein a catalyst such as  $\text{CuCl}_2$ ,  $\text{I}_2$  or  $\text{FeCl}_3$  was dissolved in a volatile organic compound such as methanol. The polymer was then immersed in the liquid catalyst solution. After immersion, the catalyst treated polymer was then subjected to vaporous pyrrole. Nothing in Bessette et al teaches that the catalysts may be used in a vaporous state instead of in a solution of a liquid volatile organic compound. Indeed, Bessette et al teaches that the solubility of the catalyst in the volatile organic compound is important.

To establish a prima facie case of obviousness, three basic criteria must be met. First, there must some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. MPEP 2143.

The cited combination of references fails to satisfy this standard. First, there is no suggestion in either reference to dissolve a vaporous halogen in supercritical carbon dioxide. The PTO has failed to provide any support for the proposition that supercritical carbon dioxide is equivalent to a volatile organic compound such as methanol. Most importantly, the PTO has failed to explain how or why the use of a catalyst in a volatile organic compound such as methanol is suggestive of the use of that same catalyst in supercritical carbon dioxide. The mere fact that references can be combined or modified does not render the resultant combination obvious unless the prior art also suggests the desirability of the combination. *In re Mills*, 16 U.S.P.Q.2d 1430 (Fed. Cir. 1990).

Indeed, it is noted that the PTO has ignored the teachings of Weiss et al that clearly indicate that inorganic salts such as  $\text{FeCl}_3$  are insoluble in supercritical carbon dioxide. The PTO has failed to provide any motivation as to why one of skill in the art would proceed against the express teachings of the principal reference.

A reference that leads one of ordinary skill in the art away from the claimed invention cannot render it unpatentably obvious. *Dow Chem. Co. v. American Cyanamid Co.* 2 U.S.P.Q.2d 1350 (Fed. Cir. 1987). For example, the Federal Circuit has clearly stated that “each prior art reference must be evaluated as an entirety, and ...all of the prior art must be evaluated as a whole”. *In re Fritch*, 23 U.S.P.Q.2d 1780, 1782 (Fed. Cir. 1992). And particularly on point, the CCPA had earlier said “[t]he test for obviousness is not whether the features of a secondary reference may be bodily incorporated into the structure of the primary reference; nor is it that the claimed invention must be expressly suggested in any one or all of the references. Rather, the test is what the combined teachings of the references would have suggested to those of ordinary skill in the art.” *In re Keller*, 108 U.S.P.Q. 871, 881 (C.C.P.A. 1981).

It is therefore respectfully submitted that the PTO's apparent position fails to provide a prima facie case of obviousness. Reconsideration of the PTO's position is respectfully requested.

5. **Rejection of Claims under 35 U.S.C. §112, 1<sup>st</sup> paragraph .**

The use of the phrase “vaporous halogens” stands rejected under 35 U.S.C. § 112, first paragraph. The examiner states that the specification, “while being enabling for iodine vapor, does not reasonably provide enablement for all vaporous halogens.” (Office Action, p. 4) In particular, the Examiner states that Applicants’ specification “does not mention that other vaporous halogens may be used or provide details as how to use the invention using a halogen other than iodine.” *Id.* Applicants must respectfully disagree.

As a preliminary matter, it is noted that the PTO has the burden of giving reasons, supported by the record as a whole, as to why the specification as a whole is not enabling, e.g., entails undue experimentation. In *re* Morehouse 192 U.S.P.Q. 29 (C.C.P.A. 1976). A disclosure is enabling, even if considerable amount of experimentation is involved, if it is merely routine. *Ex parte* Forman et al. 230 U.S.P.Q. 546 (B.P.A.I. 1986). The first paragraph of Section 112 requires nothing more than objective enablement. In *re* Marzocchi 169 U.S.P.Q. 367 (C.C.P.A. 1971).

Thus, it is not necessary that Applicants prove that all vaporous halogens will be capable of polymerizing pyrrole. The first paragraph of Section 112 requires nothing more than objective enablement. In *re* Marzocchi 169 U.S.P.Q. 367 (C.C.P.A. 1971). The C.C.P.A. pointed out that “[n]ot every last detail [of an invention need] be described [in a patent specification], else patent specifications would turn into production specifications, which they were never intended to be.” In *re* Gay, 135 U.S.P.Q. 311, 316 (C.C.P.A. 1962). Indeed, a specification need not describe—and best omits—that which is well-known in the art. In *re* Buchner, 18 U.S.P.Q.2d 1331, 1332 (Fed. Cir. 1991). The Federal Circuit has noted that “[t]he scope of the claims must be less than or equal to the scope of the enablement. The scope of enablement, in turn, is that which is disclosed in the specification plus the scope of what would be known to one of ordinary skill in the art without undue experimentation. *National Recovery Technologies, Inc. v. Magnetic Separation Systems, Inc.* 49 U.S.P.Q.2d 1671 (Fed. Cir. 1999) (emphasis added).

Here, the experimentation would not even be complex: it would merely require generating a vapor phase halogen, then following, for example, the procedure set forth in the working examples of the specification. Most importantly, the generation of a vaporous

halogen is not undue experimentation because the creation of a halogen in the vaporous state is well within the skill of an ordinary practitioner capable of looking at the boiling point of any halogen at a particular pressure. Thus, the creation of a vaporous halogen would be no more complex than the experiments typically engaged in by the ordinary practitioner.

A patent application is presumptively enabled when filed. “[A] specification... must be taken as in compliance with the enablement requirement of the first paragraph of §112 unless there is reason to doubt the objective truth of the statements contained therein which must be relied on for enabling support.” In re Marzocchi, 169 U.S.P.Q. 367 (C.C.P.A. 1971).

Thus, the PTO has the burden of giving reasons, supported by the record as a whole, as to why the specification as a whole is not enabling, e.g., entails undue experimentation. In re Morehouse 192 U.S.P.Q. 29 (CCPA 1976).

The Federal Circuit identified eight factors for use in determining whether a disclosure is sufficient to enable one of ordinary skill in the art to practice a claimed invention throughout its scope without having to engage in undue experimentation: (1) the quantity of experimentation necessary; (2) the amount of direction or guidance presented; (3) the presence or absence of working examples; (4) the nature of the invention; (5) the state of the prior art; (6) the relative skill of those in the art; (7) the predictability or unpredictability of the art; and (8) the breadth of the claims. In re Wands, 8 U.S.P.Q.2d 1400, 1404 (Fed. Cir. 1988).

The importance of these factors is reflected in the PTO’s own enablement teaching materials which state that:

...[i]t is improper to conclude that a disclosure is not enabling based on an analysis of only one of the [*Wands*] factors while ignoring one or more of the others. The examiner’s analysis must consider all the evidence related to each of these factors, and any conclusion of non-enablement must be based on the evidence as a whole.

*35 U.S.C. §112 First Paragraph Enablement Training Manual* at 8.

Applicants must respectfully submit that the instant rejection is predicated upon an improper application of the Wands factors and that the PTO has failed to meet its burden of providing a prima facie case.

Accordingly, Applicants respectfully request reconsideration and removal of the rejection.

**6. Request for an Interview**

Applicants and the Undersigned hereby request an Interview before the preparation of the next Office Action.


**CONCLUSION**

It is believed that the foregoing amendments and remarks fully comply with the Office Action and that the claims herein should now be allowable to Applicants. Accordingly, reconsideration and allowance is requested.

If there are any additional charges with respect to this Amendment or otherwise, please charge them to Deposit Account No. 06-1130.

Respectfully submitted,

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